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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/803,568	03/18/2004	Willi Bruchle	2133.029USU	5947

7590 11/16/2004  
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EXAMINER
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SOUW, BERNARD E

ART UNIT	PAPER NUMBER
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2881

DATE MAILED: 11/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/803,568

Applicant(s)

BRUCHLE ET AL.

Examiner

Bernard E Souw

Art Unit

2881



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03/18/2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 16 and 17 is/are allowed.
- 6) ☒ Claim(s) 1-3, 6-12, 15, 18 and 19 is/are rejected.
- 7) ☒ Claim(s) 4, 5, 13, 14, 20 and 21 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), (DE 103 12 271.0), filed 03/19/2003, which papers have been placed of record in the file.

### ***Information Disclosure Statement***

2. The information disclosure statement (IDS) submitted on 09/27/2004 was filed prior to the mailing date of the first Office Action. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

### ***Preliminary Amendment***

3. The Preliminary Amendment filed 03/18/2004 has been entered.  
The Specification and the Abstract have been amended.  
New claims 20-21 have been added.  
Pending in this office action are claims 1-21.

### ***Specification***

4. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is

requested in correcting any errors of which applicant may become aware in the specification.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 21 recites the limitation "*secondary radiation equilibrium thickness*" in lines 2-3. There is insufficient antecedent basis for this limitation in the claim.

The limitation "*secondary radiation equilibrium thickness*" is not recited in claim 3, but in claim 5. Consequently, in order to proceed with this examination, the dependency claim 21 is changed from claim 3 to claim 5.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 7-12 and 15 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Hall et al. (USPAT 4,123,392).

► Regarding claim 1, Hall et al. disclose a radiation shielding arrangement for shielding neutron radiation and gamma radiation from particle accelerators, [storage

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*rings, target, experimental or analytical devices,]* as recited in Col.1/II.32-37 and Col.4/II.55-65, comprising at least one shielding element made first material including bound water, as specifically recited in Col.4/II.60-61.

► Regarding claim 7, Hall's shielding element has a modular construction, as specifically recited in Col.2/II.42-48.

► Regarding claims 8-10, Hall's concrete (block), specifically recited in Col. 2/II.42-48, is inherently known (per definition of a concrete block) as a load-bearing and self-supporting formwork that has (at least) two sides.

► Regarding claims 11 and 12, Hall's shielding arrangement further comprises a neutron absorber layer having a neutron-absorbing material boron, as specifically recited in Col. 8/II.32-68 and Col.9/II.1-20.

► Regarding claim 15, Hall's load-bearing layer includes a neutron-absorbing material, as specifically recited in Col. 8/II.32-68 and Col.9/II.1-20.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 6, 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hall et al. in view of Anayama et al. (USPAT 6,517,743).

► Regarding claim 6, Hall et al. show all the limitations of claim 6, as previously applied to claim 1, except the recitation that at least one shielding element has a form of a multilayer construction. Anayama et al. disclose a radiation shielding arrangement for shielding neutron radiation and gamma radiation from particle accelerators similar to Hall's, as recited in the Title and the Abstract. Anayama's radiation shielding arrangement has a form of a multilayer construction, as recited in Col.4/ll.22-30.

► Regarding claim 8, Anayama's shielding arrangement has at least one shielding element which is a load-bearing layer, specifically a concrete formwork, having a minimum thickness that is self-supporting, as implicated in Col.1/ll.47-49 and 59-65.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to construct Hall's radiation shielding in form of a multilayer structure, as taught by Anayama, since neutron radiation and gamma radiation have widely differing penetration depths for different shielding materials, such that a multilayer of different materials is normally necessary to keep the overall thickness and/or weight a minimum, as generally known in the art.

One of ordinary skill in the art would have been motivated to modify Hall's shielding element by Anayama's self-supporting and load-bearing formwork such as concrete, in order to have an effective radiation shielding that is also mechanically stable, the latter being generally desirable in the art.

8. Claims 2, 3 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hall et al. in view of Darling et al. (USPAT 3,453,160).

Hall et al. show all the limitations of claims 2, 3 and 19, as previously applied to claim 1, further including a shielding arrangement being made of a concrete block wall over-coated by a radiation shielding layer, as recited in Col.15/ll.44-50. However, Hall et al. do not teach to use as radiation shielding the shielding material gypsum having a chemical composition  $\text{CaSO}_4 \cdot \text{H}_2\text{O}$ .

► Darling's radiation shielding element includes gypsum having a chemical composition  $\text{CaSO}_4 \cdot \text{H}_2\text{O}$ , as recited in Col.2/ll.3-10, Col.4/ll.55-60 and Col.5/ll.47-55.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Hall's concrete shielding by Darling's gypsum, since for the same shielding capability a neutron radiation shield made of gypsum is smaller weight in comparison to concrete.

9. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hall et al. in view of Darling et al., and further in view of Onoda Cement (JP 11202090 A), Kovacs et al. (Acta Montanistica Slovaca, Ročník 7, 2002, Vol. 3, pgs.156-160) and GPDA publication (brochure titled "Healthier Building with gypsum products" No.2, July 1997, pgs.1-8).

Hall et al. as modified by Darling et al. show all the limitations of claim 18, as previously applied to claims 1 and 2, except the recitation of using a gypsum that is produced from flue gas desulphurization plants.

Onoda Cement discloses a neutron shield made of gypsum that can be cost-effectively produced from sludge and city refuse incineration ashes, as recited in the

Basic Abstract, section Novelty, lines 1-3. Kovacs et al. teach that REA gypsum can be cost-effectively produced as solid and fly ash from flue gas desulphurisation process, as recited on pg. 156, lines 1-3. GPDA brochure also discloses that REA gypsum is a building material that can be obtained as a by-product from flue gas desulphurisation in power plants, as recited on pg.4, col.2, lines 1-7.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use gypsum from flue gas desulphurisation process as a building block for Hall's neutron shielding as modified by Darling et al., since such a gypsum (called REA gypsum) is quite cost-effective, as taught by Onoda Cement in combination with Klovacs's and GPDA's teaching.

***Indication of Allowable Subject Matter***

10. Claims 4, 5, 13, 14, 20 and 21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Reasons for Indication of Allowable Subject Matter***

11. The following is a statement of reasons for the indication of allowable subject matter:

► Claims 4 and 20 have a potential for being allowed for reciting a radiation shielding arrangement comprising a gypsum wall whose thickness is matched to the radiation spectra of the high energy particle accelerator to be shielded.



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- ▶ Claims 5 and 21 have a potential for being allowed for reciting a radiation shielding arrangement comprising a gypsum wall whose thickness is greater than or equal to the secondary radiation equilibrium thickness, or, specifically at least 2m, at least 5m, and at least 7m.
- ▶ Claim 13 has a potential for being allowed for reciting a radiation shielding arrangement comprising a neutron absorber layer made of boron-paraffin.
- ▶ Claim 14 has a potential for being allowed for reciting a radiation shielding arrangement comprising a concrete formwork and a gypsum wall with a neutron absorber layer arranged there between.

### **ALLOWANCE**

12. Claims 16 and 17 are allowed.

### ***Reasons for Allowance***

13. A radiation shielding arrangement for shielding neutron radiation and gamma radiation from particle accelerators, storage rings, target, experimental, or analytical devices, comprising at least one spallation layer including a material, specifically metal, wherein spallation reactions triggered by neutron irradiation generate a secondary radiation, is neither anticipated nor rendered obvious by any prior art.

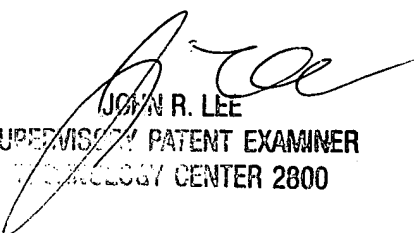
***Communications***

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard E Souw whose telephone number is 571 272 2482. The examiner can normally be reached on Monday thru Friday, 9:00 am to 5:00 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R Lee can be reached on 571 272 2477. The central fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306 for regular communications as well as for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0956.

bes  
November 9, 2004

  
JOHN R. LEE  
SUPERVISOR, PATENT EXAMINER  
TECHNOLOGY CENTER 2800